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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/730,911	12/10/2003	Yong-wan Jin	030681-603	6728
21839	7590	06/30/2005	EXAMINER	
BUCHANAN INGERSOLL PC (INCLUDING BURNS, DOANE, SWECKER & MATHIS) POST OFFICE BOX 1404 ALEXANDRIA, VA 22313-1404			PATEL, VIP	
			ART UNIT	PAPER NUMBER
			2879	

DATE MAILED: 06/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/730,911	Applicant(s) JIN ET AL.	
	Examiner Vip Patel	Art Unit 2879	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>1203</u> . | 6) <input type="checkbox"/> Other: ____. |

Claim Objections

Claims 5, ~~6, 11, 12~~ are objected to because of the following reasons. ✓

In claim 5, applicant claims that "CNT emitters have a half-circle or crescent". Here, is the applicant claiming the shape of emitter? If the applicant is attempting to claim the shape, please insert ---shape--- after "crescent". Appropriate correction is required. ✓

SIMILAR SITUATIONS APPEAR INCLUDING 12 AND 20-22.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-4, 6-11, 14-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over admitted prior art and Konuma (US 6437503).

Regarding claims 1-4, 6-11, 14-19, in prior art figures 1-2 and under the heading "description of the related art", the admitted prior art discloses a field emission device (see figure 1) comprising a cathode (2, in a complete device more than one cathodes would be positioned in parallel in first direction as per claim 6), a plurality of CNT emitters (8), a first gate insulating layer (4) having a through hole, a gate electrode (5, in a complete device more than one gate electrode would be positioned in parallel in second direction as per claim 6) having a gate hole. As to characteristics of electric field, since claimed structure is disclosed by Konuma, device of Konuma would behave the same. As per claim 14, figure 2, discloses a second gate insulating layer and a

second gate electrode (7). As per claims 3, 4, 9-11, and 17-19, emitters of Konuma are disposed side by side and correspond to one of the asymmetric gate holes (See figure 16).

The admitted prior art does not teach the claimed gate hole to be elongated, elongated slot shape (per claims 2, 7) in second direction (per claims 8, 16). However, in the same field of endeavor, Konuma discloses such elongated slot shaped gate electrode opening in second direction (see figure 20, line 39 of column 5) for obtaining an oblong potential lens and thus emission widening characteristics. Thus, it would have been obvious, at the time the invention was made, to a person having ordinary skill in the art to provide elongated slot shaped gate electrode opening as taught by Konuma in the device of admitted prior art for obtaining emission widening characteristics.

Claims 5, 12-13, and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over admitted prior art, Konuma (US 6437503), and JP 6-150836.

The admitted prior art and Konuma disclose all the limitations of claims 5, 12-13, and 20-22 except half-circle or crescent shaped emitter. This limitation is not deemed patentable since the applicant's disclosure fails to show such limitations to solve any problems or to yield any unobvious advantage that is not within the scope of the teachings applied. Therefore, such limitations would be a matter of design alternative. Alternatively, JP reference, see figure 6, discloses crescent shaped emitter for desirable emission characteristics. Thus, it would have been obvious, at the time the invention was made, to a person having ordinary skill in the art to provide crescent shaped emitter as taught by JP 6-150836 in the device of Konuma for obtaining desirable emission characteristics.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vip Patel whose telephone number is (571) 272-2458. The examiner can normally be reached on Monday-Thursday. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh D Patel can be reached on (571) 272-2457. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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PRIMARY EXAMINER
ART UNIT 2879**